

The Canadian Entomologist.

VOL. XI.

LONDON, ONT., AUGUST, 1879.

No. 8

NOTES UPON THE PREPARATORY STAGES OF CERTAIN SPECIES OF BUTTERFLIES. NO. 2.

BY W. H. EDWARDS, COALBURGH, W. VA.

4. *MELITÆA MINUTA* Edw.—Figured in Mead's Report on Butterflies of Colorado. Syn. *Arachne* Edw.

CHRYSLIS.—Length .54 inch; cylindrical; head case short, narrow, rounded at vertices, the sides sloping; mesonotum rounded, not prominent, followed by a shallow depression; the abdomen large, and offering several rows of short conical tubercles; color yellow-white or buff, marked with black; top of head case black, the antennæ cases same; mesonotum with two crescent spots on each side; on the wing case a central patch and dark border; the segments of abdomen edged with black on dorsal side; a ventral longitudinal stripe and one on either side; the tubercles black at summit, orange at base.

Sent by Mr. Boll, and obtained from larva bred by him in the spring of 1879, in western Texas. This resembles in shape the chrysalis of *Baroni* and *Phaeton*.

5. *PARNASSIUS SMINTHEUS*, var. *BEHRII*.

EGG.—Does not differ from that of type *Smintheus*, as figured in Butterflies of N. America, vol. 1. Button-shaped, the sides rounded, the top depressed, base flattened; the surface covered with a crust of hexagons, which diminish as they approach the micropyle, and show a little opening at each corner of the hexagon down to the shell; color chalky-white. Deposited on leaves of species of *Sedum*.

YOUNG LARVA.—Length .9 inch; cylindrical, thickest anteriorly, tapering slightly to last segment; the segments well rounded; color black, with four rows of tubercles on either side, not very prominent, whitish, each sending out one or more black hairs; from those of dorsal

and first lateral row one hair each ; from the second lateral row four hairs each ; from the third or lower lateral row two hairs ; head sub-globose, the surface rough but scarcely granulated, and thinly covered with short black hairs ; color black.

6. PARNASSIUS BALDUR Edw. *Clarius* Boisdl., not Eversmann.

EGG.—A little larger than *Smintheus*, of same shape, and covered in same way with a crust of hexagons ; color pale coffee-brown. Laid on species of *Sedum*.

YOUNG LARVA.—Not distinguishable in shape, markings or color from *Smintheus*.

Mr. Mead brought me, in September, 1878, a large number of the eggs of both these Parnassians, obtained by him from females shut up with *Sedum*, while he was in Nevada. I kept the eggs in a cool place until 29th December, and then brought a few of each species into a warm room. On 16th January three larvæ of *Smintheus* came forth, eating a round hole in the side of the egg. On 31st Jan'y one *Baldur* hatched. I had fresh leaves of the same *Sedum* on which the eggs had been laid, and there was an effort to gnaw the surface of these, but all the larvæ died in course of a few days. On 25th Feb'y I brought more of the eggs into my room, and the weather having turned warm at that time, the larvæ quickly came out. Most of them died very soon after, but a few eat of the leaves and grew to double their original size, when one after another died. It is possible that in nature the larvæ do not emerge until the plant is in bloom, and if I succeed in obtaining more eggs, I will retard them till *Sedum* in flower can be had. Very little is known of the larvæ of species of *Parnassius*.

7. CHIONOEAS IVALDA Mead. Fig'd in But. N. A., Part viii., Vol. 2.

EGG.—Sub-conic, broadest at base, nearly as broad as high, rounded at top ; marked by about 18 vertical ridges, the sides of which are irregularly excavated ; part of these terminate at about three-quarters the distance from base to summit, and the remainder gradually sink to the surface ; the spaces between the ridges over the top being irregularly and shallowly pitted.

YOUNG LARVA.—Length .11 inch ; stout anteriorly, tapering to last segment, which ends in two blunt conical tails, each with a terminal white bristle ; color at first soiled white, soon after greenish-white, striped longi

tudinally with dull red ; a broad medio-dorsal stripe, another on middle of side, running to tail ; a third along base of body ; between the dorsal and lateral stripes a brown line, and a second just below lateral ; on each segment from 3 to 12, on either side, are three rows of white clubbed hairs, springing from white tubercles ; head rounded, broadest below, broader than next segment ; the surface much covered with shallow punctures ; color dull yellow ; across upper front face is a curved row of four round brown tubercular spots, and six spots across middle face, each sending out a dark hair ; the ocelli dark.

This larva was received from Mr. Mead, in Nevada, and was but just out of the shell when I opened the box. Like the larvæ of the Parnasians, it came from a hole in the side of the egg. This was 18th August, 1878. The larva lived till 21st September, readily feeding on grass, and was about to pass its first moult when it was accidentally killed. It behaved like other Satyrid larvæ, being sluggish, and moving very little. Probably in nature hybernation occurs when the larva is half grown.

8. CHIONOBAS IDUNA Edw. Fig'd in But. N. A., Vol 2.

EGG.—Shaped like *Ivallda* ; the ridges sinuous, more prominent, sharper than in *Ivallda*, and the larger part extend from base to summit. Sent me by Mr. O. T. Baron.

TINEINA.

BY V. T. CHAMBERS, COVINGTON, KY.

It has so happened that within a few years past Professors Zeller and Frey in Europe, and I in the U. S., have at about the same time described a large number of American species of Tineina, and as might have been expected under these circumstances, it has occasionally happened that the same species has been twice described under different names. I am, however, surprised to find how seldom this has happened. In so far as I have been able, from the figures and descriptions of Professors Zeller and Frey, to identify their species with those described by me, I have heretofore done so in the pages of this and other journals ; and I have to thank

Dr. Hagen for the ability to make the following corrections and identifications, which I was unable to make from the published descriptions of Professors Zeller and Frey alone. Dr. Hagen has submitted to my examination some of the type specimens of those authors in the Collection of the Museum at Cambridge, and from them I am enabled to make the corrections noted below. There still remain a few of the species of Professors Zeller and Frey which I have not seen, but as types of more than three hundred of the species described by me are in the Museum, which I believe also contains types of the greater number of American species described by Frey and Zeller, the species may be readily determined by any one having access to the Collection.

Argyresthia quercicallia Cham.

From Colorado. Previously described by Zeller from Texas specimens as *A. abdominalis*.

Batrachedra Clemensella Cham.

From Kentucky and Colorado. Previously described from Texas by Zeller as *B. striolata*. In Bul. Geo. Survey, v. 3, pp. 134 and 141, I at first confounded it with *B. praeaugusta*; whilst the true *praeaugusta*, then first discovered in America, was described as a new species under the name *B. Clemensella*. Afterwards, when the supposed new species was discovered to be *praeaugusta*, the name *Clemensella* was transferred to the species which had been erroneously supposed to be *praeaugusta*, and which is the *striolata* of Zeller. I have not seen any authenticated specimens of *B. salicipomonella* Clem., but I suspect it is at most only a variety of *praeaugusta*.

Lithocolletis Hageni Frey & Boll.

In my account of *L. necopinusella* I suggested that it might prove to be *L. Hageni* F. & B., and so it turns out on examination of a type specimen of the latter species.

Lithocolletis gemmea F. & B.

With a doubt indicated by a mark of interrogation, Messrs. F. & B. identify this species with *Paractopa robiniella* Clem. Misled by this identification, I, in the Cin. Quar. Jour. Sci., vi., p. 209, made some comments on its transference from *Paractopa* to *Lithocolletis* by Messrs. F. & B., and asserted what is unquestionably a fact, that *P. robiniella* Clem. is not a

Lithocolletis, but is a *Gracilaria*. A more careful comparison of *P. robiniella* with the description of *L. gemmea* by F. & B., convinced me that the latter was a very different insect from *P. robiniella*, and that its identification therewith by F. & B. was altogether wrong; and it further convinced me of the fact that *Gracilaria mirabilis* F. & B. is *P. robiniella* Clem., which I had previously transferred to *Gracilaria* as *G. robiniella*. These corrections were made in the Cin. Quar. Jour. Sci., vi., p. 339. An examination of one of the types of *L. gemmea* shows that it is a true *Lithocolletis*, nearer perhaps to *L. ornatella* Cham. than to any other known species, but very distinct from it, and about as much like *Gracilaria* (*Parectopa*) *robiniella* Clem. (*G. mirabilis* F. & B.) as *Colias philodice* is like *Papilio asterias*.

L. aenigmatella Frey & Boll.

I have not seen a specimen of this species, but I think it will turn out to be *L. tilliaeella* Cham., described long previously.

L. Scudderella Frey & Boll.

A specimen of this species is among the insects submitted to me by Dr. Hagen. I have heretofore regarded it as equivalent to the variable *L. salicifoliella* Clem. & Cham. Unfortunately I have no specimen of the latter species now with which to compare the specimen of *Scudderella*, but I incline to the opinion, after examining *Scudderella*, that it is distinct from *salicifoliella*.

L. quercivorella, n. sp.

Face, tuft and antennae silvery white, the sides of the tuft immediately over the eyes reddish saffron, and each antennal joint with a fuscous spot on the upper side at its outer margin. Thorax and primaries reddish orange, with a wide white streak along the middle of the thorax from its anterior margin to the apex, which, when the wings are closed, is continuous with a dorso-basal streak on each fore wing, and which extends beyond the middle of the dorsal margin. There are on the fore wings three costal white streaks; the first is dark margined behind and on the costa before; the second behind and around the tip, with the dark scales produced a little way back; both of these streaks are oblique and resemble in position and character the costal streaks of *L. basistrigella*, *L. ulmella* and *L. bicolorella*. The third streak is a mere spot before the ciliae, is dark margined both before and behind, and opposite to it is a dorsal white

streak pointing obliquely backwards, densely dark margined behind, its dark margin continued into the densely dusted apex. Ciliae silvery grayish with a basal dark brown hinder marginal line. Hind wings pale silvery fuscous with silvery ciliae. Abdomen pale yellow; tip silvery. Legs white; tarsi annulate with black. *Al. ex.* $\frac{1}{4}$ inch.

The form and size of the mine in leaves of *Q. obtusiloba*, and the general reddish saffron hue of the insect, ally it to *L. Bethuncella*, *L. unifasciella* and *L. castaneæella*, one of which I believed it to be until I bred it. In other respects it is allied as closely to the *ulmella* group, as above stated.

Incurvaria mediotriatella Clem., Proc. Acad. Nat. Sci., Jan'y, 1860, p. 5.

Tinea auristrigella Cham., CAN. ENT., v. 5, p. 86.

I am satisfied that in *T. auristrigella* I have re-described Dr. Clemens' species, though I see no sufficient reason for separating it from *Tinea*. *T. iridella* Cham. will probably also be referred to *Incurvaria*.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY REV. C. J. S. BETHUNE, M. A.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. x., p. 217.)

[286.] VIII. LEPIDOPTERA.

FAMILY PAPILIONIDÆ.

[288.] 403. *PONTIA CASTA* Kirby.—Plate iii., fig. 1.—Three specimens taken in Lat. 65°.

[A well-known variety of *Pieris oleracea* Boisd.; quite common in Canada.]

[289.] FAMILY NYMPHALIDÆ.

404. MELITÆA SELENIS *Kirby*.—Taken in North America. [Is our common *M. tharos*.]

405. ARGYNNIS CYBELE *Fabr.*—Taken in Canada by Dr. Bigsby. [Common in Canada ; for description and figures, and for a full account of the differences that distinguish this species from *A. aphrodite*, No. 407, see Edwards' "Butterflies of N. America," Part i.]

[290.] 406. ARGYNNIS MYRINA *Fabr.*—Taken in Canada by Dr. Bigsby. [Quite common in Canada and well-known to collectors.]

407. ARGYNNIS APHRODITE *Fabr.*—Taken in Canada by Dr. Bigsby. [Quite common ; see our note on *A. cybele* above.]

[291.] 408. ARGYNNIS FREYA *Esper.*—Expansion of the wings $1\frac{1}{2}$ inches. Three specimens taken near Cumberland-house, Lat. 54° .

Stalk of the antennæ yellow with a large compressed dark-brown knob, red underneath at the base and tip ; wings tawny, dark-brown at the base, with a narrow black band occupying the posterior margin, followed by a series of black arrow-headed spots ; next to which in the primaries is a zigzag angular discoidal black band, and at the anterior margin five transverse spots of the same colour ; the underside of these wings is tawny variegated with black and white spots and lines ; the secondaries are underneath reddish-brown variegated with white and yellow spots and bands, with a discoidal arrow-headed white spot in the centre ; the fringe of the wings is alternately white and yellow.

[A decidedly northern insect ; has been taken in Labrador.]

[292.] FAMILY VANESSIDÆ.

409. VANESSA C-ARGENTEUM *Kirby*.—Plate iii., figs. 6 and 7. Expansion of the wings 2 inches. A single specimen taken in Lat. 54° .

Antennæ brown above, pale below ; knob pale at the tip ; wings angular, cut out into sinuses which are dentated ; primaries above orange-tawny, with five black round spots forming a right-angled triangle with each other ; two triangular costal bars and posterior margin black ; above the black marginal band is a series of paler tawny triangular spots ; underneath the wings are veined, marbled and clouded with black, brown, and cinereous ; the primaries have a very broad paler band near the margin ;

secondaries above dull-orange, at the base with a black spot or two near the anterior margin; the other half is black with a transverse series of triangular pale spots, the interior ones being nearly obsolete; the disk is inscribed with a slender silver somewhat obtusangular C, with the concavity towards the anterior margin.

[Synonymous with our common *Grapta prognæ* Cramer.].

410. *VANESSA FURCILLATA* Say.—Taken in Canada by Dr. Bigsby. Common in the N. West Territory and the vicinity of Fort William.

[Synonymous with *V. Milberti* Godt., a common and very familiar butterfly throughout Canada. For description and figure see Say's Am. Entomology, vol. ii., pl. 27.]

[293.] 411. *VANESSA ANTIOPA* Linn.—Taken in Canada by Capt. Sheppard. [Too common in Canada to require any description.]

[294.] 412. *VANESSA ATALANTA* Linn.—Several taken in Canada. [Quite common; for description see Harris' Insects of Mass., p. 294.]

[295.] 413. *CYNTHIA CARDUI*.—Linn.—[Another very common butterfly; see Harris' Insects of Mass., p. 291.]

[296.] 414. *CYNTHIA HUNTERA* Drury.—[Almost as common as the preceding species; see Harris' Insects, p. 292. This and the two preceding species are now included in the genus *Pyrameis* Hubn.]

[297.] FAMILY HIPPARCHIADÆ.

415. *HIPPARCHIA NEPHELE* Kirby.—Expansion of the wings $2\frac{1}{2}$ inches. Taken in Canada by Dr. Bigsby.

Antennæ brown annulated with white, rufous at the end; knob slender; wings brown; primaries both above and below with a paler submarginal broad band including two eyelets; the upper ones surrounded by a paler atmosphere, with a black iris and white pupil; on the under side the atmosphere of the eyelets is more distinct and forms a kind of glory round them; the pupil is snowy-white with some blue scales scattered round it; the under side of both wings, above the band, is marbled with transverse deeper coloured streaks; the secondaries are dentated but not the primaries, which at the margin have two transverse black parallel

lines ; in the former there is anteriorly a costal paler bar, and the posterior half of the wing is paler ; between the bar and the marginal paler band are three minute eyelets, with a black iris and bluish pupil, arranged transversely in a triangle ; and three more similar ones arranged obliquely, the external one minute, in the paler part, the internal one pointing to the anal angle.

[Quite common in Canada ; included in the genus *Satyrus* Westwood.]

[298.] 416. *HIPPARCHIA DISCOIDALIS* Kirby.—Plate iii., figs. 2, 3.—Expansion of the wings $1\frac{3}{4}$ –2 inches. Several specimens taken at Cumberland-house, Lat. 54° .

Body brown. Antennæ annulated with white ; wings very entire, brown ; costa spotted with gray ; a triangular obscure reddish-tawny discoidal stripe extends from the base to the posterior margin of the primaries, and is discoverable also on the under side where the wing is faintly clouded with gray at the tip ; the secondaries underneath are indistinctly marbled and clouded with gray or whitish scales ; fringe whitish and brown alternately.

[A northern species ; has been taken at Fort Simpson, and in Alaska.]

FAMILY LYCENIDÆ.

417. *THECLA AUGUSTUS* Kirby.—Plate iii., figs. 4, 5.—Expansion of the wings 1 inch. Taken in Lat. 54° .

Antennæ annulated with white ; knob elongated ; wings dusky black with a dull ferruginous disk ; fringe alternately black and white ; secondaries underneath black at the base ; at the apex dusky ash-coloured, with a transverse series of about eight black spots, rudiments of which appear on the same surface of the primaries.

Named after the Esquimaux Augustus.

[Taken in Canada, the New England States, and New York.]

[299.] 418. *LYCÆNA DORCAS* Kirby.—Plate iv., fig. 1.—Expansion of the wings 1 inch. Taken in Lat. 54° .

Body black above, white underneath. Antennæ black, annulated with white ; knob tipped with orange ; wings brown with a reddish tint, underneath tawny ; primaries with an angular band formed of faint black spots ; behind these nearer the costa is a black bar, above which are two more

spots; between the band and the posterior margin are three more black spots arranged transversely, and above the base are three spots forming a triangle; the secondaries have a slight sinus near the anal angle, the fringe of which projects so as to assume the appearance of a shorttail; a cross the disk runs an angular band formed of faint black spots, above which is a crescent of the same colour; at the anal angle is an orange coloured angular bar, or abbreviated band; underneath, these wings have several indistinct black dots, the three external ones of which form an obtuse angle with the four internal ones.

This species seems the American representative of *L. Phleas*, but its colour is much less vivid.

[Belongs to the genus *Chrysophanus* Hubn.; it is probably identical with *C. Americana* D'Urban.]

419. *POLYOMMATUS LUCIA Kirby*.—Plate iii., figs. 8, 9.—Expansion of the wings 1 inch. One specimen taken with the preceding.

[300.] Wings above silvery-blue, terminating, especially at the posterior margin, in a very slender black line; fringe white barred with black; primaries underneath ash-coloured mottled with white; in the disk is a black crescent and a curved macular band, consisting of, mostly, oblique black crescents edged with white, especially on their under side; the wing terminates posteriorly in a broadish, brown band, formed chiefly by obsolete eyelets; the secondaries are brown; underneath spotted and striped with black and white; towards the posterior margin the white spots are arranged in a transverse band parallel with it; and, as in the primaries, the wing terminates in several obsolete eyelets.

[Figured by Harris (Ins. Mass., figs. 105, 106) under the name of *P. pseudargiolus*. Not uncommon in Canada and the Northern States.]

FAMILY HESPERIADÆ.

420. *HESPERIA PECKIUS Kirby*.—Plate iv., figs. 2, 3.—Expansion of wings 1 inch and $\frac{1}{2}$ a line. Taken with the preceding, and also by Prof. Peck.

Body brown, paler on the under side. Antennæ rufous above, below the joints have a patch of white scales; knob fusiform, hooked; wings above tawny-brown, with an articulate angular band, common to both wings, of pale yellow; primaries striped and streaked with the same colour

near the base, and in the costal area ; underneath the wings are paler; the primaries have nearly the same marks as above but more conspicuous ; on the secondaries the angular band is surmounted by another irregular spot, so as to form two contiguous spots, or rather one large irregular didymous one.

[Quite common in Canada.]

[301.] FAMILY ZYGÆNIDÆ.

421. *ALYPPIA MAC CULLOCHII Kirby*.—Plate iv., fig. 5.—Expansion of wings $1\frac{3}{8}$ inch. Taken in Nova Scotia by Dr. Mac Culloch, and in Canada by Dr. Bigsby.

Body and wings very black. Orbit of the eyes externally clothed with white hairs ; base-covers or tippets whitish ; primary wings with three very white spots, one near the base oblique, obversely wedge-shaped, divided into two by a longitudinal black line ; next, at a little distance from the anterior margin, is a subtrapezoidal, small, white spot, between which and the posterior margin is an articulate band, abbreviated at each end, of the same colour, consisting of six spots divided by black lines ; the same spots distinguish the under surface of these wings, and besides there is a whitish longitudinal one in the costal area ; in the secondaries are also three white spots on both surfaces, viz., a large rectangular one near the base divided longitudinally into four ; a longitudinal undivided one at the anterior margin ; and an articulate posterior abbreviated band, divided into five spots ; the longitudinal costal streak may almost be regarded as forming a sixth, as the lower end is parallel with the last spot of the band ; the four anterior legs are externally covered with long orange coloured hairs, which character is also found in *A. octomaculata*.

FAMILY SPHINGIDÆ.

422. *SMERINTHUS CERISYI Kirby*.—Plate iv., fig. 4.—Expansion of the wings $2\frac{3}{4}$ inches. Taken in North America, locality not stated.

[302.] Body ash-coloured ; thorax with a large trapezoidal brown spot dilated next the abdomen ; primaries angulated, ash-coloured, with a transverse series of brown submarginal crescents in a paler band, between which and the posterior margin is another obsolete paler one ; above the crescents is a straight whitish band, and a linear angular forked one under the internal sinuses of which the wings are clouded with dark brown ;

underneath the above markings of the wing are very indistinct; the secondaries are rose-colour, paler at the costal and posterior margins; underneath they are dusky-cinereous, with a whitish band coinciding with that of the primaries, a transverse series of crescents and a dentated brownish band, all rather indistinct; but the most conspicuous character of the secondaries is a large eyelet situated at the anal angle, consisting of a black pupil, nearly but not quite surrounded by a blue iris, and situated in a black triangular spot or atmosphere, which extends to the anal angle, and is surmounted by some blue scales; the abdomen above is dusky ash-coloured.

This insect appears to be the American representative of *S. ocellatus*, from which, however, it differs considerably. It comes very near to *S. geminatus* (Say *Am. Ent. i., t. xii.*), but in that the eyelet has two blue pupils.

423. *DEILEPHILA INTERMEDIA* Kirby.—Expansion of wings $2\frac{1}{2}$ inches. Taken in North America.

This species is intermediate between *D. Euphorbiae* and *D. Galii*, which last it most resembles, but the anterior portion of the mesal stripe of the primary wings is pale rose-colour; the fringe of their inner margin, and of the posterior of the secondaries is white; there is no series of white dots on the back of the abdomen and the ventral segments are fringed at the apex with white hairs. This description was taken from an old specimen apparently somewhat faded.

[Is probably identical with *D. Chamenerii* Harris, a common species in Canada.]

[303.] FAMILY SESIADÆ.

424. *SEsia RUFICAUDIS* Kirby (*Sphinx pelasgus* Cramer).—Expansion of the wings $2\frac{1}{8}$ inches. Taken in Canada by Dr. Bigsby, and in New Jersey by Mr. Drake.

Body yellow-olive, underneath pale-yellow. Antennæ black; primaries reddish-brown, hyaline in the disk, with the hyaline part half divided towards the base with a costal bar, covered with yellow-olive hairs at the base; underneath the costa, the posterior margin and the nervures are dark ferruginous; there is also a yellow stripe on the inner side of the base; secondaries hyaline in the disk; base externally and costa yellow; internally the base is ferruginous; underneath the dark part of the wing

is ferruginous, and the base pale-yellow ; two first segments of the abdomen yellow-olive, two next black, the rest ferruginous with pale-yellow lateral spots.

This species appears to be the American representative of *Sesia fuciformis*, which it greatly resembles, but differs in the colour of the tail and the base of the secondaries.

[This description is not sufficiently definite for the determination of the species.]

FAMILY LITHOSIADÆ.

425. *CALLIMORPHA PARTHENICE* Kirby.—Expansion of the wings $1\frac{3}{4}$ inch. Taken in North America.

[304.] ♂. Antennæ black, bipectinated ; thorax flesh-coloured with two anterior, and three posterior, oblong, black spots, the latter being the largest ; primary wings black, with the so-called rivulets pale with a slight pinkish tint ; the main streams, especially towards the apex of the wing, form several islets, most of which are divided by slenderer ones which do not appear on the under side of the wing ; the secondaries are of the colour of red lead, with five black spots towards the posterior margin, the intermediate three forming a macular band, above which is one smaller one and below it another ; underneath there is also a small spot, at the costal margin, above the others.

[A species of *Arctia*, probably identical with *A. virgo* Linn. ; not uncommon in Canada.]

426. *CALLIMORPHA VIRGUNCULA* Kirby.—Plate iv., fig. 6.—Expansion of the wings $1\frac{1}{2}$ inch. Taken in Canada by Dr. Bigsby.

Head pallid ; orbit of the eyes, and the mouth, black ; antennæ black, serrato-pectinate ; thorax pallid, with five lanceolate black spots, the posterior ones being the largest ; primary wings black, with pallid rivulets, which are formed by the scales that clothe the nervures, and produce the rays at the apex of these wings, where the lines are traversed by a transverse, angulated band ; underneath they are pale, with the black parts less distinct, except at the apex ; there is a black spot in the disk near the costal margin ; the secondaries are orange-tawny, spotted at the apex with black ; abdomen tawny above, below pale, with a dorsal, and on each side a double, lateral, black, macular stripe ; trunk underneath black, with pale

hairs intermixed ; legs black ; tibiae pale above ; thighs with a pale spot at the base and apex.

This is nearly related to the preceding species, but is much smaller ; and the painting and spotting of the wings differ materially.

[A species of *Arctia* ; taken in Canada.]

[305.] 427. *LITHOSIA MINIATA Kirby*.—Expansion of the wings $1\frac{1}{2}$ inch. Taken in Canada by Dr. Bigsby.

Head, trunk, base and apex of the abdomen, costal and anal margin, mesal forked stripe of the primary wings, and base of the secondary, miniatous or of the colour of red lead ; two longitudinal stripes and the space between the apical fork of the primaries, apex of the secondaries, and middle of the abdomen, slate-coloured.

[Belongs to the genus *Hypoprepia* Hübn. ; not uncommon in Canada.]

FAMILY CTENUCHIDÆ.

428. *CTENUCHA LATREILLANA Kirby*.—Expansion of wings $2\frac{1}{8}$ inches. Taken in Canada by Dr. Bigsby, and in Nova Scotia by Dr. Mac Culloch.

[306.] Body, and primary wings, light-brown. Antennæ and anal hairs black ; head and base of the primaries, bright orange ; trunk, back of the abdomen, and outside of the thighs, cyaneous or blue-green ; fringes of the wings white, but in the middle of the posterior margin brown ; secondaries short.

[Previously described under the specific name of *virginica* Charp. ; quite common in Canada.]

Mr. W. F. Kirby has been transferred from the Natural History Museum, Royal Dublin Society, to the British Museum. His new address is 5 Union Road, Tufnell Park, London N., England.

TORTRICIDÆ.

BY PROF. C. H. FERNALD, STATE COLLEGE, ORONO, ME.

Tortrix (Loxotaenia) Clemensiana, n. s.

Head and thorax above ochre yellow; palpi darker on the outside, lighter beneath; antennæ dark ochre yellow, minutely pubescent in the male; legs straw yellow, in some specimens the fore and middle legs are fuscous in front; thorax beneath and abdomen above and beneath silvery fuscous, in some specimens very light straw color; anal tuft light straw color.

Fore wings straw yellow, some specimens inclining to ochre yellow. Most of the examples before me show the venation on the upper side of the fore wings in darker lines; costal fold short and near the base of wing; beneath fuscous in the males, very light straw yellow in the females; fringes light straw yellow above and beneath.

Hind wings very light straw yellow above and below, or nearly white, darker towards the apex and fuscous in some specimens towards the anal angle; fringes above and beneath nearly white.

Expanse—♂ 20-23 m. m.; ♀ 19-21 m. m.

Habitat—Maine, Mass., N. Y., Wis. Described from twenty males and seventeen females.

This species is in the collection of Dr. Clemens, now in the collection of the Am. Ent. Soc., under the name of *Tortrix pallidana*, but no description was published, and since the name *pallidana* is pre-occupied, I have named it for Dr. Clemens.

This species has a strong superficial resemblance to *Tortrix lata* Robs. and *Tortrix pallorana* Robs., but may be at once distinguished by the costal fold on the fore wings of the male, which does not occur in *lata* or *pallorana*.

Tortrix (Lophoderus) juglandana, n. s.

Head, thorax and fore wings reddish brown to dark brown. Fore wings each with two oblique narrow bands of darker brown than the ground color of the wing; the first, beginning at about the basal third of the costa, extends obliquely across to the middle of the inner border; the second begins near the middle of the costa and extends obliquely across the wing parallel to the first band, and ends at the anal angle; these

bands expand somewhat on the costal and inner borders. On the fore wings of most of the males are scattered scales of a straw yellow color, especially bordering the oblique bands; fringes of the fore wings lighter in the middle, but at the apex and anal angle concolorous with the oblique bands.

Hind wings above, with their fringes, as well as the abdomen above and the under side of fore wings, fuscous. Under side of hind wings and legs lighter.

Expanse—♂ 15-20 m. m.; ♀ 20-26 m. m.

Habitat—Mass., N. Y., Ontario, Ohio, Wis.

Described from eleven males and fifteen females.

Raised by James Angus, of West Farms, N. Y., on Hickory leaves.

Penthina osmundana, n. s.

Front of the head and first two joints of the palpi, light ochre yellow; last joint of the palpi, two spots on the outside of the middle joint of the palpi, vertex, thoracic tuft and an edging of scales around the patagia, dark purple; front of thorax dark reddish brown with violet reflections in certain lights.

Fore wings dark reddish brown with a large reddish yellow subtriangular spot, the base resting upon and occupying the middle half of the hinder border of the wing, while the opposite angle extends nearly to the costa. The basal patch has numerous lead-blue metallic scales scattered over it, showing a slight indication of an arrangement in cross lines in some specimens, the outer edge beginning at the basal third of the costa, extends directly across the wing as far as the middle of the cell, thence in a more or less waved line across to the hind margin near the humeral angle. This line is frequently indicated by whitish scales. From the middle of the costa an interrupted double row of lead-blue metallic scales extends obliquely across the wing towards the outer margin, confluent on the disk, curving downward beyond and ending near the anal angle. Numerous similarly colored scales rest upon the outside of the yellow spot, and in a line curving up and outward join the previously described line, leaving the ocellus quite free. On the costa beyond are three light colored geminate spots faintly seen, from the inner one of which a lead-blue line extends obliquely outward, and curving down, ends near the middle of the outer margin. More or less black scales rest upon the borders of these lines. Fringes fuscous, purple in one specimen.

Hind wings and abdomen above, together with all the wings beneath, fuscous, with violet reflections. Body, abdomen beneath, together with the legs, lighter. Fore legs in front light brown with lighter rings at the ends of the joints.

Expanse 12 m. m.

Described from five males and one female.

Found feeding on *Osmunda regalis* in Orono, Me., by Mr. A. Allen, drawing the leaves together with its silken threads. Emerged July 1, 1879.

Grapholitha albimaculana, n. s.

Head, antennæ, thorax, abdomen above and fore wings, ashy grey, the scales of the fore wings tipped with whitish. A white triangular spot rests upon the middle of the hind margin of the fore wing and extends upwards to the fold, edged with black on the side next the thorax. Four small geminate white spots rest upon the costa; the first at the basal third, from which a metallic band of dull leaden hue extends across the wing to the white spot on the hind margin; the next two costal spots beyond are somewhat nearer each other than to the others; from the first of these a metallic band extends across the wing, terminating near the anal angle; the fourth spot is near the apex and sends a metallic stripe to the outer margin just below the apex; beneath this is a short metallic stripe extending downward and forming the outside of the ocellus, which last contains two parallel black dashes. The space between the first and second bands is more or less filled with black from the costa downward. Fringes metallic with a black line at the base.

Hind wings above and below white at the base, sprinkled with dark scales, blackish on costa and outwardly, fringes lighter. Underside of fore wings fuscous, showing traces of the markings above. Underside of body and abdomen silvery white. Palpi and all the tarsi greyish, the latter tipped with whitish.

Expanse of wings 13 m. m.

Described from two males taken in Orono, Me.

Retinia ? Comstockiana, n. s.

Head in front, basal joints of antennæ and palpi white; last joint of

palpi and a few scales upon the outside of the middle joint dark grey. Eyes black, vertex light sulphur-yellow to straw-yellow, antennæ dark brown annulated with whitish. Thorax above white with a few scattered grey scales; beneath silvery white. Abdomen above light brown with a silvery lustre, lighter at the end of each segment; beneath lighter; last segment in the females darker brown above and beneath, and without the silvery lustre. Anal tuft in the males light straw-color. Fore and middle legs light brown, femora and tibia of hind legs white, tarsi of all the legs brown ringed with white. Fore wings ferruginous brown, the extreme costal edge from base to near the apex dark brown. A number of small white spots rest upon the costa, four pairs beyond the middle, from all of which stripes composed of white and leaden-hued scales extend more or less irregularly across the wing at nearly right angles with the costa, and having something of a wavy appearance in some specimens, with some indication of a basal patch, a central and subterminal bands composed of the leaden and white scales. Fringes light brown above and beneath; fore wings light brown beneath, ferruginous apically, with the white spots of the costa well indicated. Hind wings above and beneath greyish brown with a tinge of ferruginous in some specimens, and with darker irrorations on the costa and outwardly; fringes long at the anal angle, somewhat lighter and with a darker line near the base.

Expanse—♂, 18-20 m. m.; ♀, 18-20 m. m.

Habitat—Ithaca, N. Y.

Described from two males and three females received from Prof. J. Henry Comstock, who "found the larvæ boring in branches of *Pinus rigida* at Ithaca," and to whom I dedicate this species.

I have provisionally referred this species to the genus *Retinia*, for, although it agrees with the definition of the genus as given by Heinemann in other respects, the venation of the fore wing differs in the origin of veins four and five, which are not from the same point, but a little remote from each other; the distance between veins five and six at their origin is about twice the distance between veins four and five.

The Annual Meeting of the Entomological Society of Ontario will be held in the rooms of the Natural History Society, in Ottawa, on Tuesday, the 23rd of September, at 4 p.m.

INJURIOUS AND BENEFICIAL INSECTS FOUND ON THE
ORANGE TREES OF FLORIDA.

BY WM. H. ASHMEAD, JACKSONVILLE, FLORIDA.

Since my discovery of the mite found preying upon the eggs of the Orange Scale Insect (*Aspidiotus Gloverii*), I have been studying the insects found on the Orange tree, and my study has resulted in bringing to light many curious insects, of which I submit the following brief description. Those interested will find a full account of their habits in the *Florida Agriculturist*.

Glover's White or Yellow Orange Mite.

Acarus ? Gloverii, n. sp.—Soft, flattened, oval, of a pale yellow color, with a broad pinkish flesh-colored stripe extending from thorax down the middle of abdomen, terminating at hinder edge, which is obtuse; legs eight, thin, finely pubescent, with two claws. Length about .01 of an inch. In company with them are often seen pale flesh-colored specimens, which are the immatures ones.

I find it mentioned by Townend Glover in an old Agricultural Report published in 1855. It seems pretty widely distributed through Florida and is found in company with the Oval Scale Insect (*Aspidiotus citricola*) on the eggs of which it probably feeds.

Aphelinus of the Orange Scale.

Aphelinus aspidioticola, n. sp.—Head and thorax light reddish brown; head nearly same width as thorax, three ocelli, eyes prominent, dark; antennæ three-jointed (?), the last joint is club-shaped; a dark brown spot on thorax at base of each wing; wings hyaline, both fore and hind wings ciliated from end of costal vein; no other apparent veins; a small dark reddish spot on fore wings at termination of costal vein; abdomen rather elongated, and of a darker shade of brown than the thorax, with two oblong spots of very dark brown on each side; legs rufo-testaceous, with a tibial hair at junction with tarsi. There is also a short ovipositor, hardly

perceptible. I have found numbers of the scales of *Aspidiotus citricola* with a hole perforated in the top by the *Aphelinus*, into which it crawls and lays its eggs; the larvæ on hatching feed upon the eggs of the Scale Insect. Glover also mentions having found it.

Leaf-Scaled Coccus.

Lecanium phyllococcus, n. sp.—Oval, convex, cinereous (entirely coated with a powder-like substance). Antennæ eight-jointed, inserted below and under the eyes; abdomen composed of eight or more segments; surrounding the outer edge is a series of leaf like scales extending to the head; legs six. Length from .03 to .14 of an inch. Some are very large and nearly round, which I believe are the females ready to lay their eggs. The eggs are laid under a cotton-like substance and are elliptical, of a pale yellow color; about .02 of an inch in length. It is found in the new shoots and terminal branches.

My attention has been drawn to a strange insect by Rev. T. W. Moore, which he supposes is the cause of the Orange rust. It may be termed the Oil-eating Mite of the Orange, belonging to the genus *Typhlodromus*, and is probably the first species of this genus discovered in America.

Typhlodromus oiliivorus, n. sp.—Whitish, flesh color, elongate, cylindrical, gradually increasing in size until near the head it becomes twice as thick as at tail; abdomen apparently consisting of numerous very thin segments; at the extremity is a bifid appendage that evidently assists in clinging to the Orange; just above it protrude two caudal filaments; head almost entirely hidden in thorax; beak short and black; legs four, rather stout, with one claw and two tarsal hairs. It is too small to measure with my instrument, so must wait until I can get a micrometer to ascertain its length.

They attach themselves to the oil cells; as the oil exudes the chemical action of the atmosphere causes it to oxidize, and the result is a hard rusty skin. They all fall off and disappear half an hour after the fruit has been picked; hence the reason why microscopists could never detect any insect, and as a *dernier* resort, attributed the rust to a fungoid. Thus the long-vexed question of what causes the Orange rust is solved, and proves to be not a fungoid, as many suppose, but an infinitesimal creature that could never have been discovered except with the aid of a microscope.

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